BRUHATH BANGALORE MAHANAGARA PALIKE
BYATARAYANAPURA DIVISION

Name of the work: Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura

Second and Part Bill
Test Report

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

TEJUS CONSULTANTS

Project	Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	M/s Tejus Consultants		
Contractor	Benaka Developers & Project Pvt.Ltd.		
Proposed Use	BC	**Date of Sampling**	**29.04.2019**
Sample Location	At plant	**Date of Testing**	**29.04.2019**

Sl. No.	Description		Test No.			Spec Limit (%)
			1	2	3	
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	412.00	452.00	426.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	300.00	360.00	336.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	112.00	92.00	90.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	27.18	20.35	21.13	
5	Average Aggregate impact value	(%)	22.89			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

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TEJUS CONSULTANTS

Authorised Signatory

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike

TEJUS
CONSULTANTS

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project :	Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor:	Benaka Developers & Project Pvt.Ltd.

Type of Material	BC	**Proposed Use**	**BC**
Sample Location	At plant	**Date of Sampling**	**29.04.2019**
		Date of Testing	**29.04.2019**

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	621	72	549	65
16.0	12.5	1212	110	1102	85
12.5	10.0	510	70	440	60
10.0	6.3	500	50	450	50
Total		**2843**	**302**	**2541**	**260**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.62
Elongation Index(%):	10.23
Combined FI+EL (%)	20.85

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Authorised Signatory

TEJUS CONSULTANTS

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore

AE (LSR)

GRADATION FOR BC
(As per MORT&H 500-18,Grading-2)

Name of Work	:	Improvements to roads and drains from Renaissance Aero Arts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	29.04.2019
Type of Mix	:	BC
Sample I/D	:	BC3

Sample Location:	At plant	Date of Sampling:	29.04.2019
Type of material & Purpose:	BC	Date of testing:	29.04.2019
		Oven Dry Wt.(gms):	1200.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	140	140.0	11.67	88.33	79 - 100
9.50	112	252.0	21.00	79.00	71 - 95
4.75	225	477.0	39.75	60.25	53 - 71
2.360	124	601.0	50.08	49.92	42 - 58
1.180	136	737.0	61.42	38.58	34 - 48
0.600	116	853.0	71.08	28.92	26 - 38
0.300	124	977.0	81.42	18.58	18 - 28
0.150	66	1043.0	86.92	13.08	12 - 20
0.075	100	1143.0	95.25	4.75	4 - 10
Pan	57.0				
Total	1200.0				

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AE (Lgt)

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

Authorised Signatory

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work :	Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	30.04.2019
Type of Mix :	BC
Sample I/D :	BC1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	850	855
2. Weight of Mixture after extraction, g	806	811
3. Weight of Bitumen	44	44
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.00	4.20
6. Weight of fines, g	2.00	2.20
7. Weight of Bitumen & fines	46.00	46.20
8. Bitumen content in %	5.41	5.40
9. Average Bitumen content in %	**5.41**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION

(As per MORT&H 500-18,Grading-2)

Sample Location:	At site	Date of Sampling:	30.04.2019
Type of material & Purpose:	**BC**	Date of testing:	30.04.2019
		Oven Dry Wt.(gms):	806.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	100	100.0	12.41	87.59	79 - 100
9.50	65	165.0	20.47	79.53	71 - 95
4.75	135	300.0	37.22	62.78	53 - 71
2.360	100	400.0	49.63	50.37	42 - 58
1.180	85	485.0	60.17	39.83	34 - 48
0.600	85	570.0	70.72	29.28	26 - 38
0.300	45	615.0	76.30	23.70	18 - 28
0.150	60	675.0	83.75	16.25	12 - 20
0.075	75	750.0	93.05	6.95	4 - 10
Pan	56.0				
Total	806.0				

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MNLY.N.D
AE(WA)

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike

TEJUS CONSULTANTS

Authorised Signatory

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work :	Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	30.04.2019
Type of Mix :	BC
Sample I/D :	BC1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	873	794
2. Weight of Mixture after extraction, g	828	753
3. Weight of Bitumen	45	41
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	2.10	2.00
7. Weight of Bitumen & fines	47.10	43.00
8. Bitumen content in %	5.40	5.42
9. Average Bitumen content in %	**5.41**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-18,Grading-2)

Sample Location:	At site	Date of Sampling:	30.04.2019
Type of material & Purpose:	**BC**	Date of testing:	30.04.2019
		Oven Dry Wt.(gms):	828.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	98	98.0	11.84	88.16	79 - 100
9.50	102	200.0	24.15	75.85	71 - 95
4.75	111	311.0	37.56	62.44	53 - 71
2.360	116	427.0	51.57	48.43	42 - 58
1.180	82	509.0	61.47	38.53	34 - 48
0.600	60	569.0	68.72	31.28	26 - 38
0.300	78	647.0	78.14	21.86	18 - 28
0.150	51	698.0	84.30	15.70	12 - 20
0.075	60	758.0	91.55	8.45	4 - 10
Pan	70.0				
Total	828.0				

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Authorised Signatory

Assistant Executive Engineer
Kodigehalli Sub D

DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	30.04.2019
Type of Mix :	Tack coat
Sample I/D :	1

Determination	Unit	Test No		
		1	2	3
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.762	0.748	0.755
Final weight of plate after application of tack Coat (c)	Kg	0.785	0.771	0.778
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.250	0.256	0.251
Average	Kg/sq.m	0.252		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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AE (W)

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

Authorised Signatory

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

TEJUS CONSULTANTS

Project	Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	M/s Tejus Consultants		
Contractor	Benaka Developers & Project Pvt.Ltd.		
Proposed Use	BC	**Date of Sampling**	**02.05.2019**
Sample Location	At plant	**Date of Testing**	**02.05.2019**

Sl. No.	Description		Test No.			Spec Limit (%)
			1	2	3	
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	381.00	364.00	341.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	285.00	260.00	255.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	96.00	104.00	86.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	25.20	28.57	25.22	
5	Average Aggregate impact value	(%)	26.33			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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TEJUS CONSULTANTS

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Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahana...
Bangalore

TEJUS
CONSULTANTS

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project :	Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura		
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant :	M/s Tejus Consultants		
Contractor:	Benaka Developers & Project Pvt.Ltd.		
Type of Material	BC	**Proposed Use**	**BC**
Sample Location	At plant	**Date of Sampling**	**02.05.2019**
		Date of Testing	**02.05.2019**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	635	73	560	70
16.0	12.5	1226	112	1125	85
12.5	10.0	564	72	450	60
10.0	6.3	520	56	460	50
Total		**2945**	**313**	**2595**	**265**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.63	
Elongation Index(%):	10.21	
Combined FI+EL (%)	20.84	

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Authorised Signatory

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike

GRADATION FOR BC
(As per MORT&H 500-18,Grading-2)

Name of Work	:	Improvements to roads and drains from Renaissance Aero Arts,Santoshi Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	02.05.2019
Type of Mix	:	BC
Sample I/D	:	BC3

Sample Location:	At plant	Date of Sampling:	02.05.2019
Type of material & Purpose:	BC	Date of testing:	02.05.2019
		Oven Dry Wt.(gms):	1200.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	152	152.0	12.67	87.33	79 - 100
9.50	124	276.0	23.00	77.00	71 - 95
4.75	218	494.0	41.17	58.83	53 - 71
2.360	136	630.0	52.50	47.50	42 - 58
1.180	134	764.0	63.67	36.33	34 - 48
0.600	120	884.0	73.67	26.33	26 - 38
0.300	124	1008.0	84.00	16.00	18 - 28
0.150	80	1088.0	90.67	9.33	12 - 20
0.075	50	1138.0	94.83	5.17	4 - 10
Pan	62.0				
Total	1200.0				

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Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore - 560 092

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work :	Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	03.05.2019
Type of Mix :	BC
Sample I/D :	BC1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	872	830
2. Weight of Mixture after extraction, g	827	787
3. Weight of Bitumen	45	43
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	2.10	2.00
7. Weight of Bitumen & fines	47.10	45.00
8. Bitumen content in %	5.40	5.42
9. Average Bitumen content in %	**5.41**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-18,Grading-2)

Sample Location:	At site	Date of Sampling:	03.05.2019
Type of material & Purpose:	**BC**	Date of testing:	03.05.2019
		Oven Dry Wt.(gms):	827.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	85	85.0	10.28	89.72	79 - 100
9.50	115	200.0	24.18	75.82	71 - 95
4.75	119	319.0	38.57	61.43	53 - 71
2.360	124	443.0	53.57	46.43	42 - 58
1.180	80	523.0	63.24	36.76	34 - 48
0.600	60	583.0	70.50	29.50	26 - 38
0.300	76	659.0	79.69	20.31	18 - 28
0.150	51	710.0	85.85	14.15	12 - 20
0.075	40	750.0	90.69	9.31	4 - 10
Pan	77.0				
Total	827.0				

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Bruhat Bangalore Mahanagara Palike
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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	**Improvements to roads and drains from Renaissance Aero Apts, Santosh Vihar Phase-1 and Phase-2 of Jakkur Layout and Surrounding areas in Ward No.7,Byatarayanapura**
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	03.05.2019
Type of Mix :	Tack coat
Sample I/D :	1

Determination	Unit	Test No		
		1	2	3
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.783	0.781	0.750
Final weight of plate after application of tack Coat (c)	Kg	0.806	0.804	0.773
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.250	0.256	0.251
Average	Kg/sq.m	0.252		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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AE(WS)

Assistant Executive Engineer
Kodigehalli Sub Division
Bruhat Bangalore Mahanagara Palike
Bangalore

Authorised Signatory